REMARKS

Claims 1-14, 19 and 20 are pending. Claims 15-18 are withdrawn. Reconsideration and further examination is respectfully requested.

Claims 1-14 and 19-20 have been rejected under 35 U.S.C. §102(a) as being anticipated by "Operations Review of June 14, 2000 PG&E Bay Area System Events Using Aempfast Software" (hereinafter "Optimal Technologies"). This rejection is respectfully traversed.

Claims 1, 2, 10 and 19 variously recite "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses." (emphasis added). As discussed below, these aspects of the claimed invention are not disclosed by Optimal Technologies.

These aspects of the claimed invention promote comprehensive assessment of the effects of an electric power network by using a single mathematical model accounting for the interdependency of a plurality of transmission lines and a plurality of transmission electrical elements with a plurality of distribution lines and a plurality of distribution electrical elements to evaluates the electric power network. These aspects of the claimed invention permit interdependencies between transmission-level effects from transmission lines and transmission electrical elements and distribution-level effects from distribution lines and distribution electrical elements to be included in energy network analysis by integrating a model of transmission-level buses with a model of distribution-level buses, improving the accuracy of the evaluation.

Further, these aspects of the claimed invention enable assessment of the behavior of the entire electric power network at multiple distribution-level buses. These aspects are submitted not to be disclosed or suggested by the cited reference.

Optimal Technologies is understood to disclose analyzing a power network by identifying loads that contribute to voltage collapse and ranking generators according to their output ability. (page 7, §1, ¶¶ 1-4; page 13, § 3, ¶ 1) However, Optimal Technologies merely discloses analyzing a set of supplied data and does not disclose "integrating the model of the transmission-level buses with the model of the distribution-level buses" to generate a single mathematical model which "models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses" (page 15, § 4.1.1, ¶ 2) There is no disclosure in Optimal Technologies of generating the model used to analyze the power network, much less a disclosure of integrating a model of the transmission-level buses with a model of the distribution-level buses.

Rather, Optimal Technologies merely discloses receiving an external data file describing power network components. (page 15, §4.1.1, ¶ 2; page 18, § 5.1, ¶1) This received data file is then reformatted and partitioned to identify a subset of the data file for analysis. (page 15, § 4.1.1, ¶¶ 3-4; page 18, §5.1.2) The identified subset is then analyzed using load flow analysis to simulate power network operation. An optimizer is then applied to the identified subset to determine network indices. (page 15, § 4.1.1, ¶¶ 5-6). Hence, Optimal Technologies merely discloses receiving a data file describing a power network, reformatting the data file and identifying a subset of the received data for analysis. Nowhere does Optimal Technologies

disclose "integrating the model of the transmission-level buses with the model of the distribution-level buses" to generate a "single mathematical model," as claimed, but merely uses the content of a data file from an external source to describe the power network to be subsequently analyzed.

In the analysis disclosed by Optimal Technologies, the content of received data file specifies how the power network is modeled. In contrast, the claimed invention generates the model used for power network analysis by "integrating the model of the transmission-level buses with the model of the distribution-level buses," to generate a "single mathematical model" of the electric power network. This integration of transmission-level model and distribution-level model provides the benefits described above. In contrast, Optimal Technologies does not integrate disparate models to generate the model used for analysis, but merely uses the contents of the received data file to perform the analysis. As disclosed by Optimal, the received data set, rather than the Aempfast software performing the analysis, specifies how the power network is modeled.

In describing the procedure used to analyze an example electric power network, Optimal Technologies initially receives a Cal ISO data file which is subsequently reformatted and partitioned to identify a subset of the data file for analysis using conventional load flow analysis (page 18, §§ 5.1-5.1.2; page 19, §§6.1-6.1.2; page 19, table 3). It is respectfully noted that, as known in the art, Cal ISO regulates, operates and plans high-voltage transmission (*See* www.caiso.com) The reformatting disclosed by Optimal Technologies merely converts the data file from a first format to a second format (in the example provided, the data file is converted from a GE PSLF EPC data file format to a CWF file format). The partitioning described by Optimal Technologies merely identifies a subset of the data file to be further analyzed (in the

example provided, the PG&E subsystem is extracted from the WECC system described by the data file) (pages 16-17, § 4.2.2, 4.2.2.2). Examination of Table 4 in Optimal Technologies shows that, after a subset of the data file has been partitioned and during analysis of the subset of the data file, the Aempfast software does not add one or more distribution electrical elements or otherwise modify to the original data set to integrate both transmission and distribution models of the power network (page 20, § 6.2; Table 4). This described analysis procedure fails to disclose the claimed element of "integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as claimed.

Thus, Optimal Technologies merely reformats and partitions received data while relying on the received data to describe the power network being analyzed, regardless of how the received data represents the power network. Optimal Technologies merely analyzes a subset of the received data using load flow analysis and an optimizer and does not generate a single mathematical model "by integrating the model of the transmission-level buses with the model of the distribution-level buses," or generate any type of model. In Optimal Technologies, the received data file is used to simulate operation of the power network so analysis of the power network does not involve "integrating the model of the transmission-level buses with the model of the distribution-level buses," but merely analyzing the received data file. While the claimed invention integrates "the model of the transmission-level buses with the model of the distribution-level buses" to generate a "single mathematical model," Optimal Technologies

merely reformats, partitions and analyzes a data file describing a power network received from an external source.

In the Final Office Action, the Examiner cites additional references to further illustrate the Examiner's interpretation of the disclosure of Optimal Technologies. However, even interpreting Optimal Technologies in view of these additional references, there is no disclosure of "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as claimed. The additional references cited by the Examiner merely disclose possible benefits of using the Aempfast software referenced by Optimal Technologies for analyzing data describing a power network. These additional references do not disclose or suggest that the Aempfast software generates the model which simulates the power network.

The Teresko article referenced by the Examiner merely indicates that Aempfast is able to view contributions of various network components in real-time. However, this real-time component monitoring does not disclose or suggest that the Aempfast software integrates "the model of the transmission-level buses with the model of the distribution-level buses" to generate "a single mathematical model," but merely indicates that the Aempfast software is able to rapidly received and process data. The Teresko article merely alludes to the ability of Aempfast to efficiently receive and analyze data, and does not disclose or suggest that Aempfast generates "a

single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses," as claimed, to analyze the received data.

Similarly, the BusinessWire article referenced by the Examiner merely lists various types of data analysis that Aempfast may perform. However, this listing of data analysis types and results merely lists possible benefits of using Aempfast to analyze power network data, such as "real-time emergency response analysis" and "advanced emergency response and contingency planning for local, regional and national power grids." However, similar to the Teresko article, the BusinessWire article does not disclose how the Aempfast software models the power network to provide these benefits. Nothing in the BusinessWire article discloses or suggests that the Aempfast software provides these potential benefits by "generating a single mathematical model by integrating the model of the transmission-level buses with the model of the distribution-level buses," as claimed.

The alleged benefits of using the Aempfast software to analyze data described by Optimal Technologies and mentioned by the additional references do not disclose the claimed element of "integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses." The possible benefits of data analysis using the Aempfast software described in Optimal Technologies, the Teresko article and the BusinessWire article are achieved by receiving an initial data file, reformatting the data set, partitioning to data set to identify a subset of data for analysis, performing load flow analysis on the data set and applying

an optimizer to the data set. (page 15, § 4.1.1, ¶¶ 2-6) The data set, rather than the Aempfast software, specifies how the power network is modeled. In contrast, the claimed invention integrates "the model of the transmission-level buses with the model of the distribution-level buses," to generate a "single mathematical model" of the electric power network used for analysis. Thus, while Optimal Technologies relies on the initially received dataset to analyze a power network, the claimed invention generates the model uses for power network simulation by "integrating the model of the transmission-level buses with the model of the distribution-level buses."

Thus, Optimal Technologies fails to disclose the claimed element of "integrating the model of the transmission-level buses with the model of the distribution-level buses, wherein the single mathematical model further models the interdependency of the plurality of transmission lines and the plurality of transmission electrical elements included in the model of the transmission level buses and the plurality of distribution lines and the plurality of distribution electrical elements included in the model of the distribution-level buses," as variously recited in independent claims 1, 2, 10 and 19.

Dependent claims 3-9, 11-14 and 20 variously recite additional patentable features such as: "integrating models of theoretical transmission-level real and reactive energy sources connected to one or more of the plurality of transmission level buses into the single mathematical model," or "integrating additional models of theoretical transmission-level loads into the single mathematical model," or "adding to the single mathematical model the models of the energy sources at one of the distribution-level buses and transmission-level buses, wherein the models of real energy sources are added subject to actual limits appropriate for dispatchable demand reductions available on the electric power network, and the real energy sources with

reactive energy sources are added subject to actual limits appropriate for generation at load sites within the electric power network," or "calculating impacts and effects across the simulated electric power network of the theoretical distribution-level real and reactive energy sources connected on one or more of the plurality of distribution level buses."

These aspects of the claimed invention are not disclosed in Optimal Technologies, which is understood to disclose identifying loads that contribute to voltage collapse and ranking generators according to their output ability without describing the type of model used to rank generators or identify loads (page 13, § 3, ¶ 1). Therefore, Optimal Technologies does not anticipate these claims that are, accordingly, submitted to be patentably distinguishable over the cited art.

Favorable consideration is solicited. Should the Examiner wish to discuss the above Remarks, or if the Examiner believes that for any reason direct contact with Applicants' representative would help to favorably dispose this case, the Examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,
PETER B. EVANS, ET AL.

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By: /Brian G. Brannon/

Brian G. Brannon, Reg. No. 57,219
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7610
Fax.: (650) 938-5200

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